

Figure 1: Single Transceiver on a Line

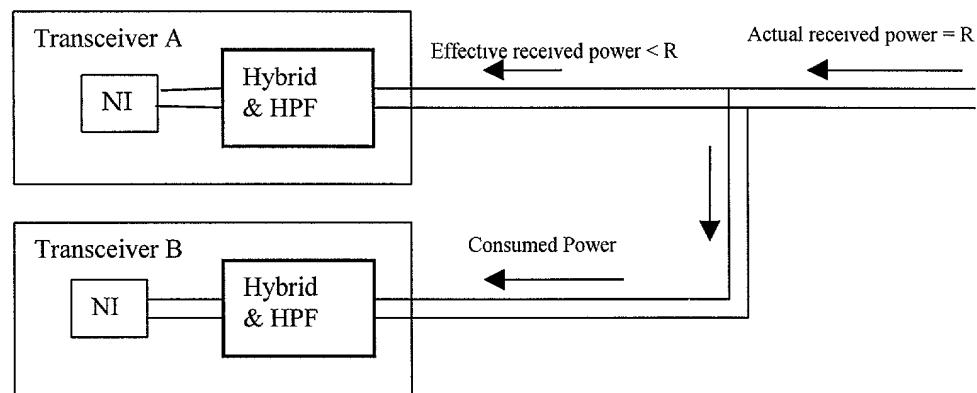


Figure 2: Attenuation of the Received Signal

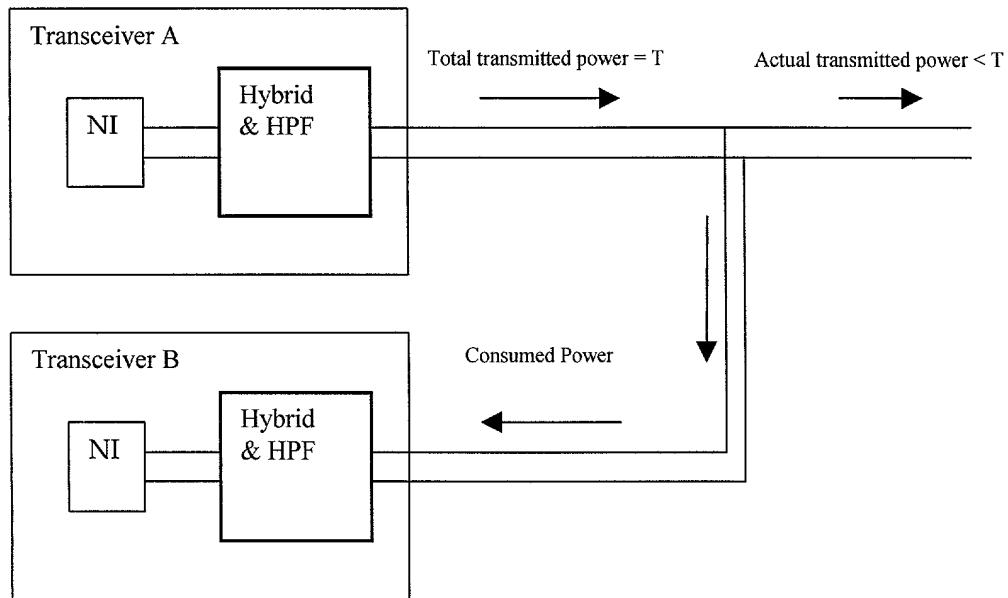


Figure 3: Attenuation of Transmitted Signal

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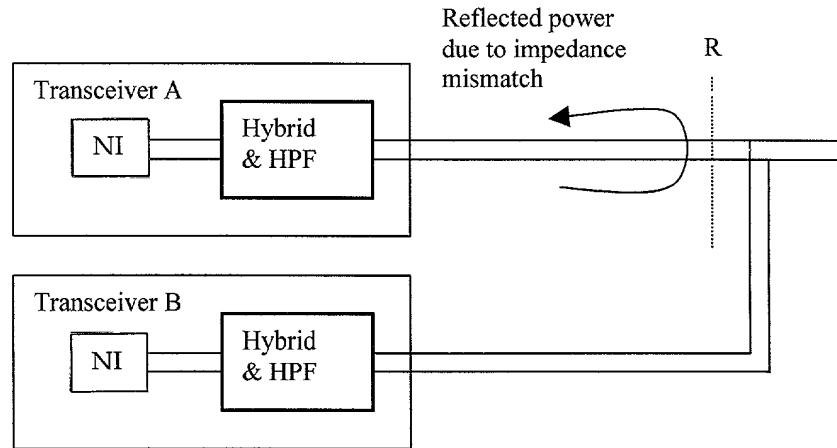


Figure 4: Echo of the Transmitted Signal

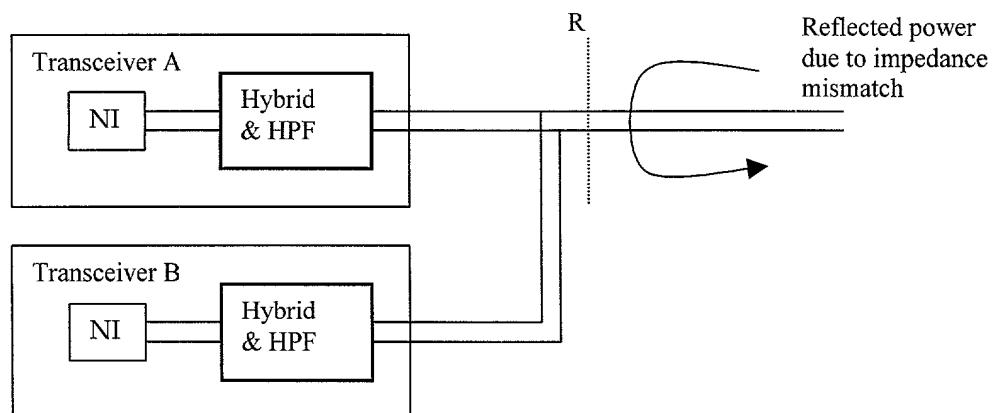


Figure 5: Echo of the Received Signal

#### Legend

NI: Normal Impedance

HI: High Impedance

HPF: High Pass Filter

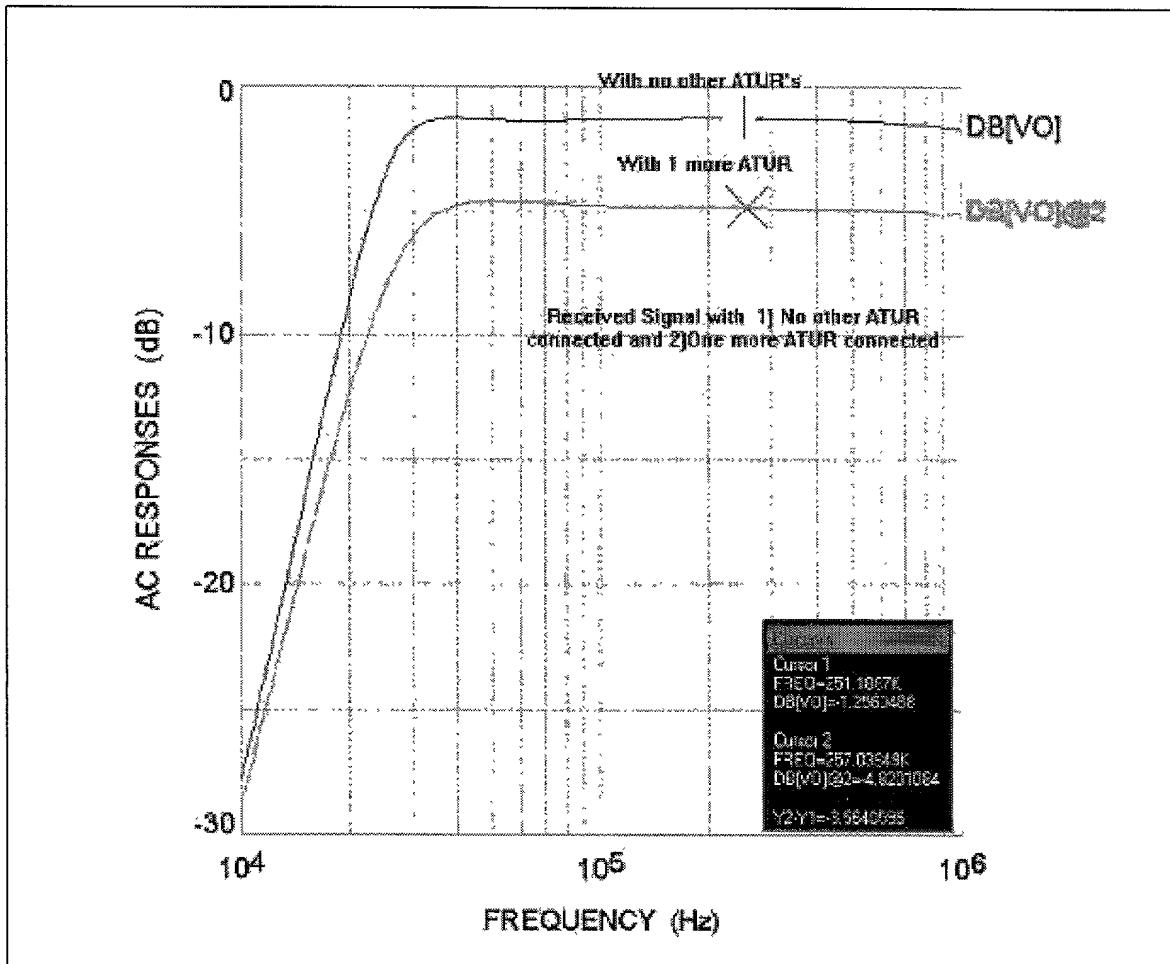


Figure 6: Reduction in the Signal Received by the ATU-R

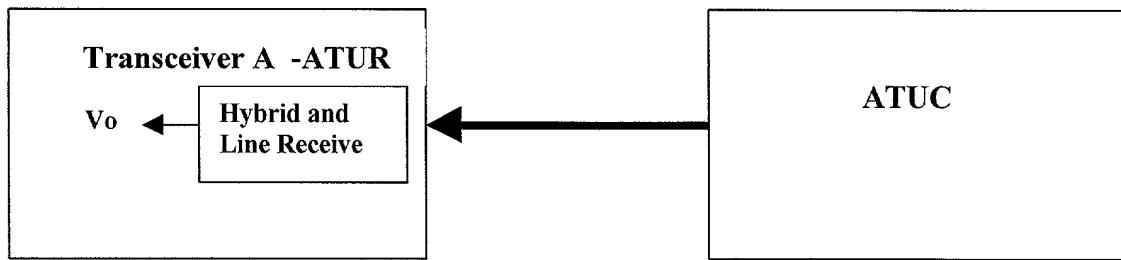


Figure 6a: Signal received when only one ATU-R is connected

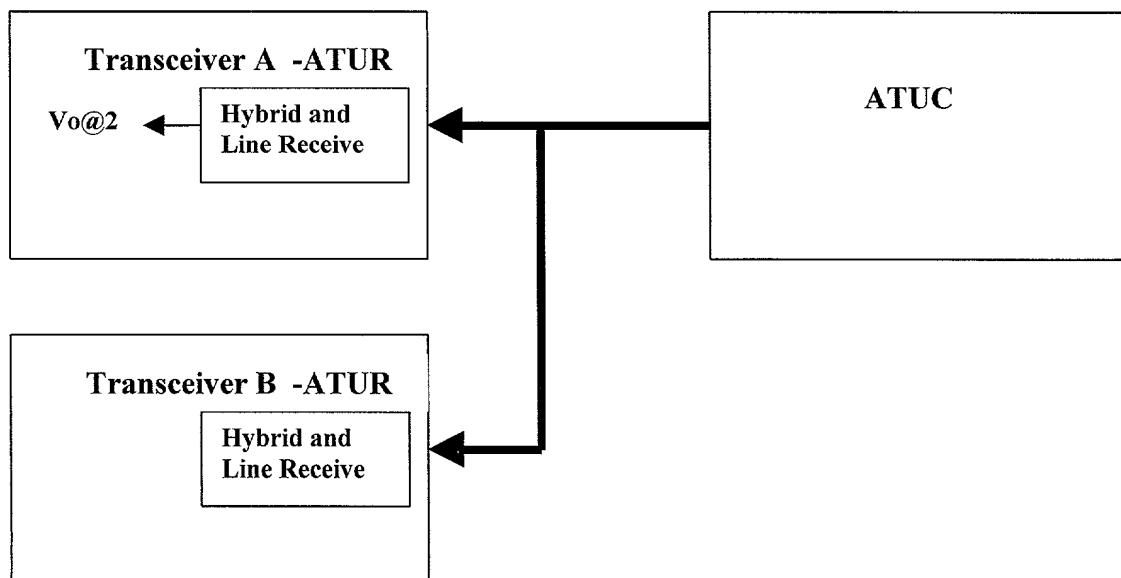


Figure 6b: Signal received when an additional ATU-R is connected to the same line

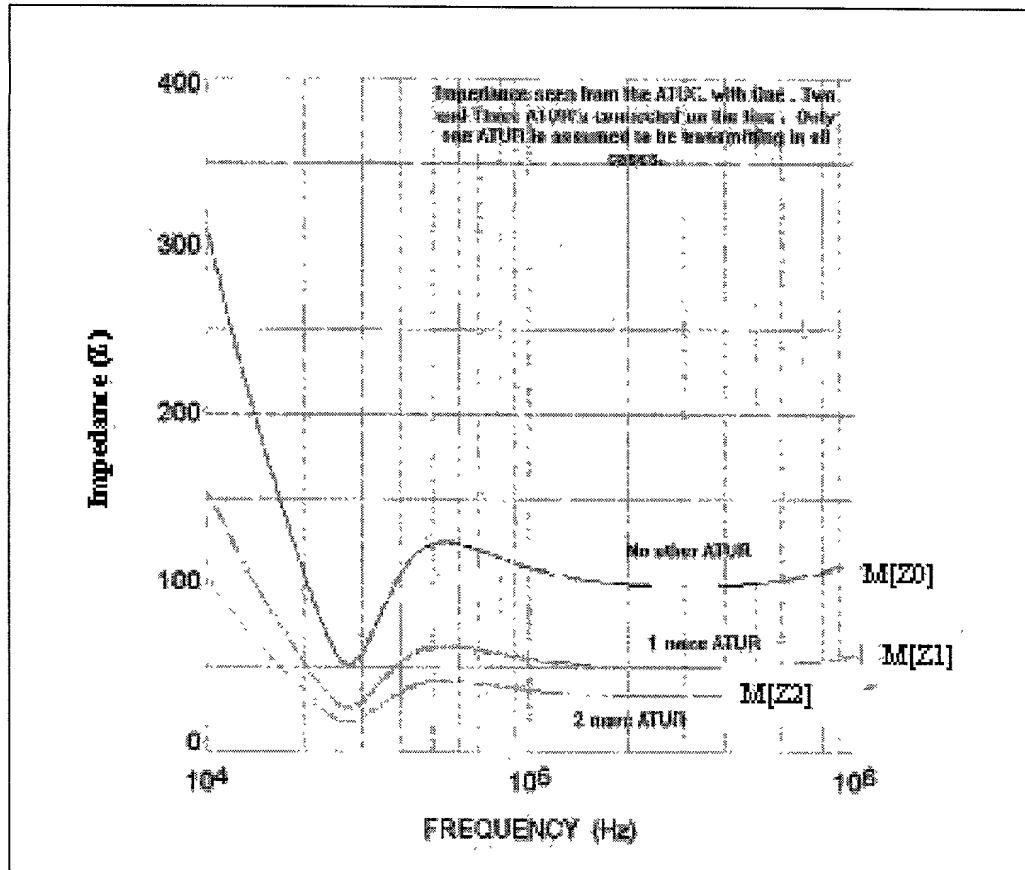


Figure 7: Reduction in the Effective Impedance with Multiple ATU-Rs

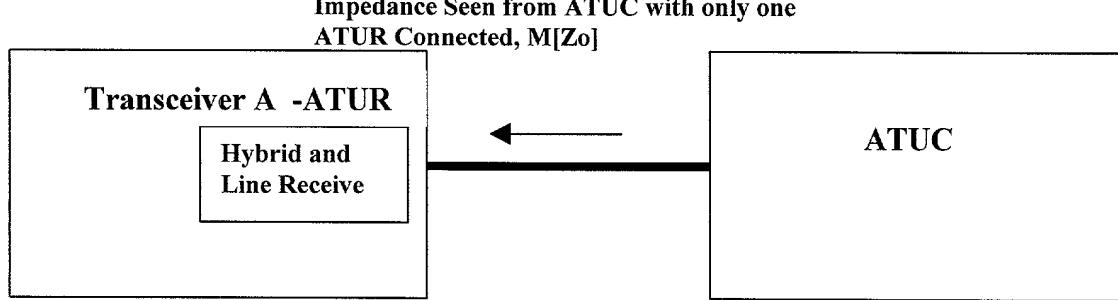


Figure 7a: Impedance seen by the ATU-C with one ATU-R connected to the line

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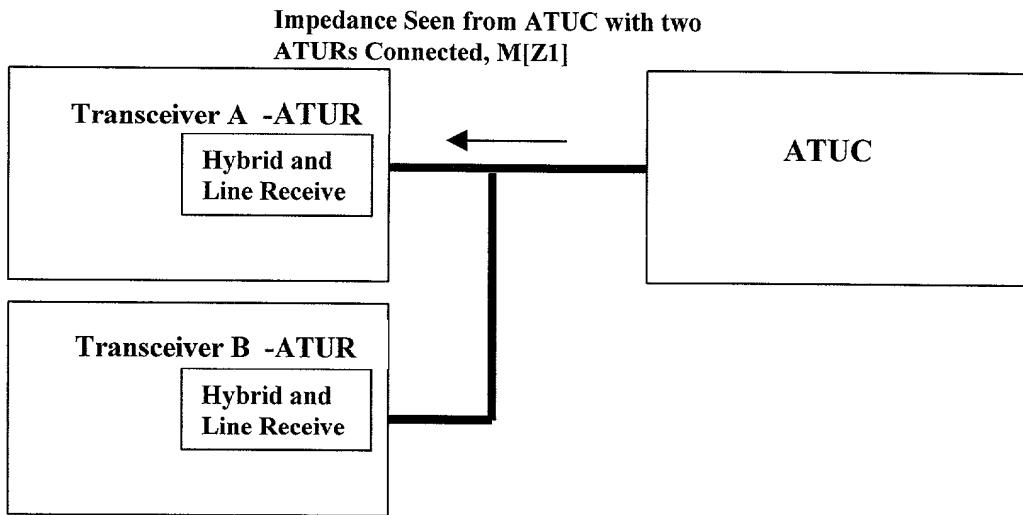


Figure 7b: Impedance seen by the ATU-C with two ATU-Rs connected to the line

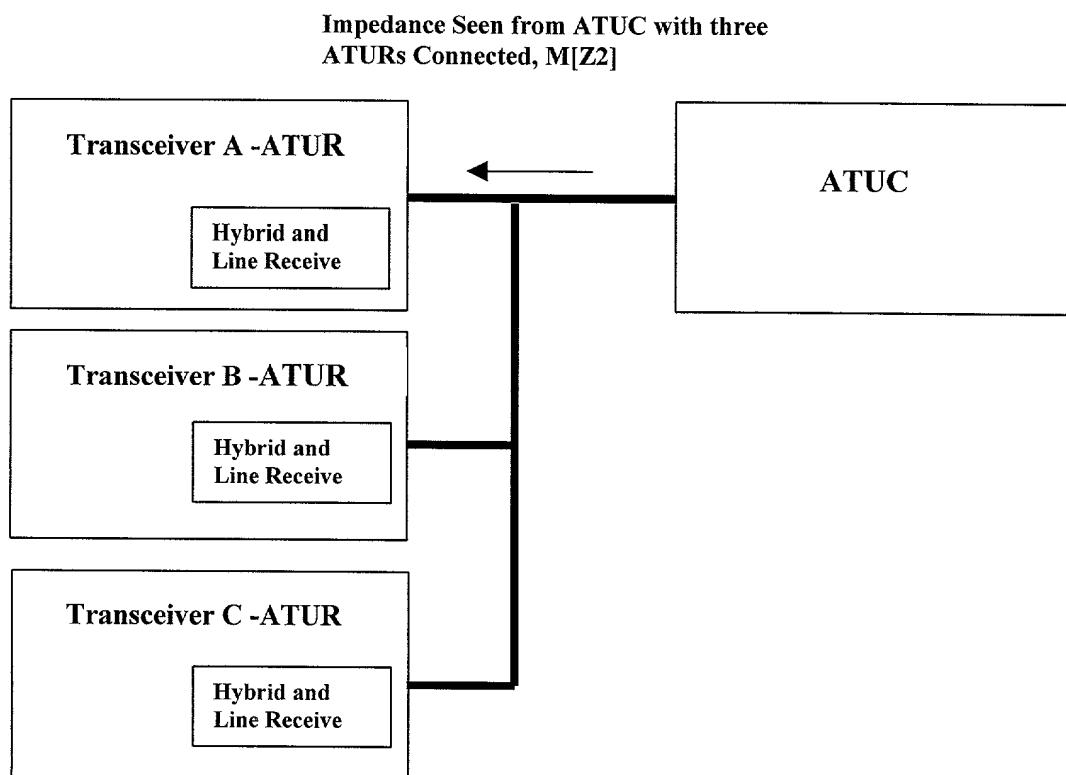


Figure 7c: Impedance seen by the ATU-C with three ATU-Rs connected to the line

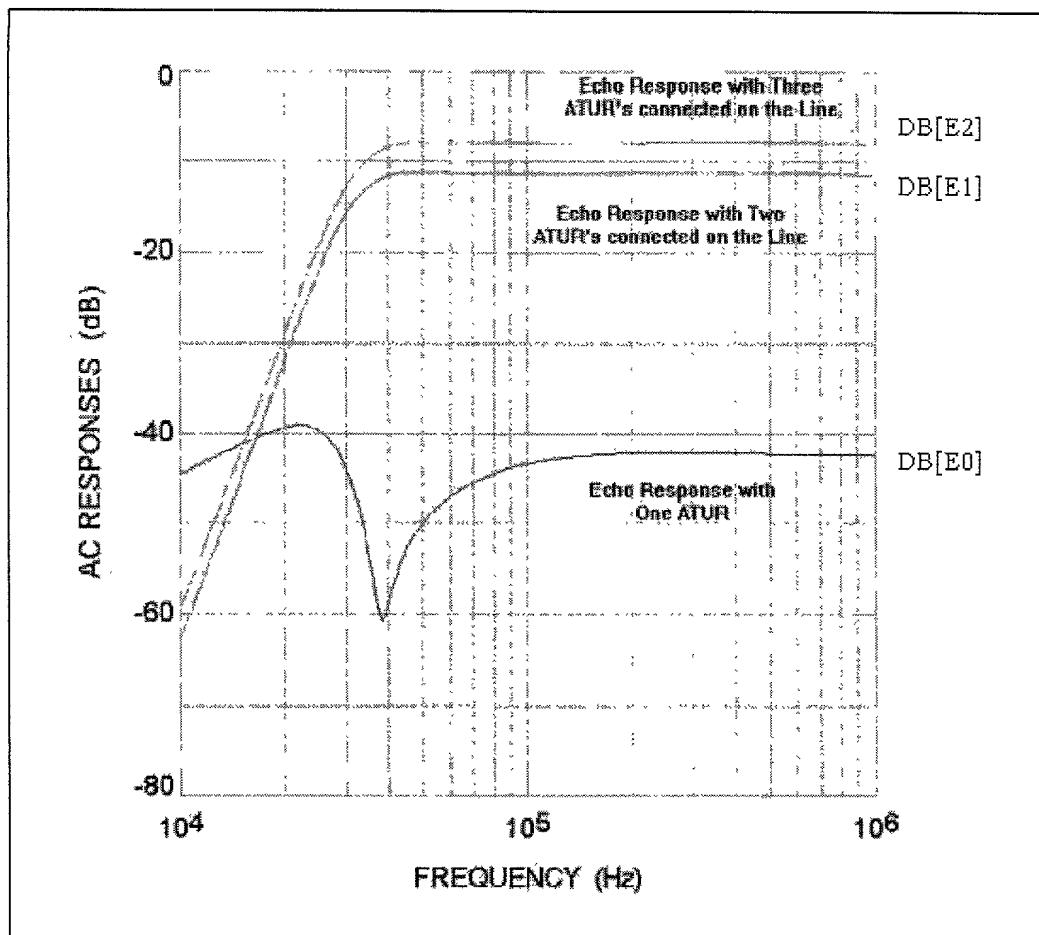


Figure 8: Increase in the Echo at the ATU-R due to other ATU-Rs

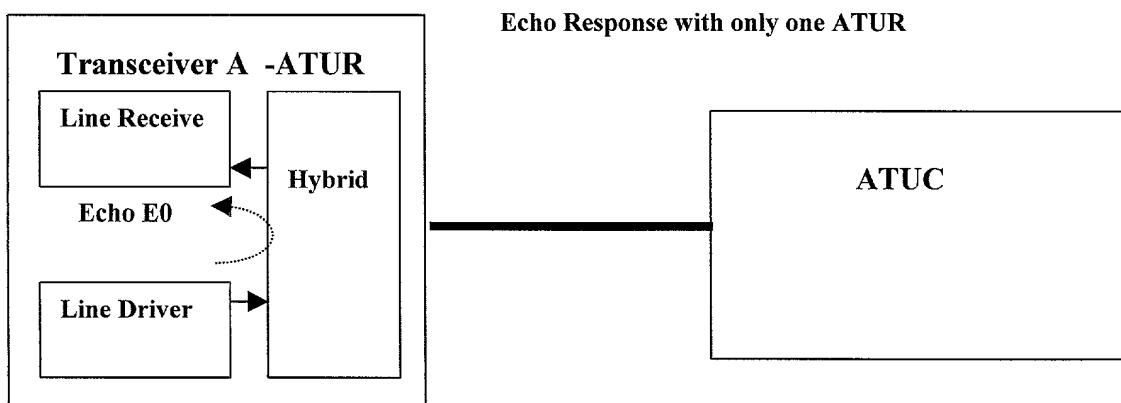


Figure 8a

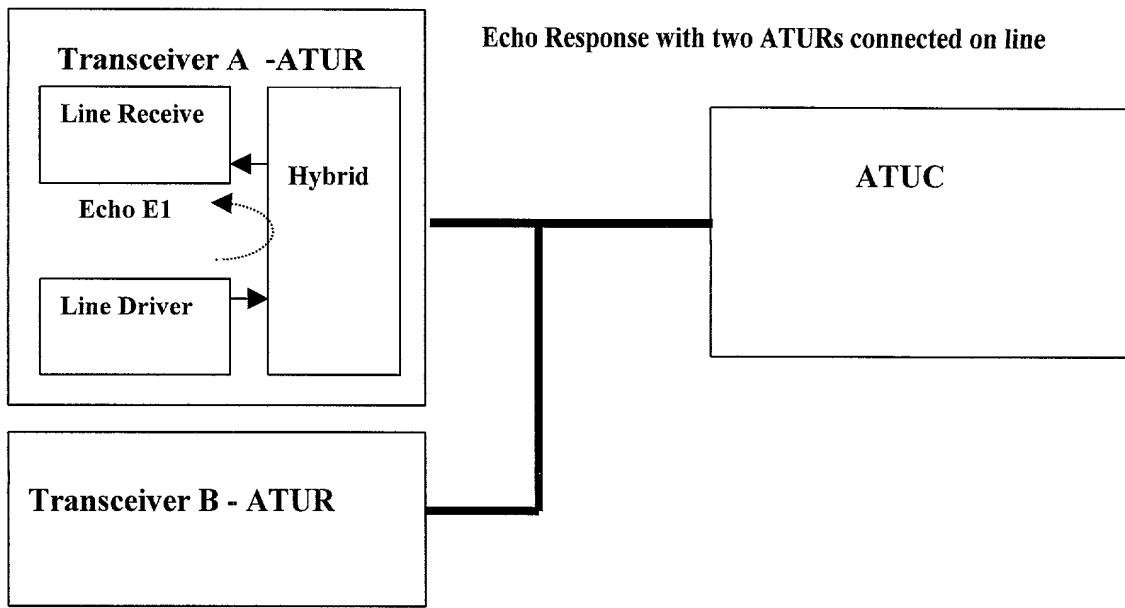


Figure 8b

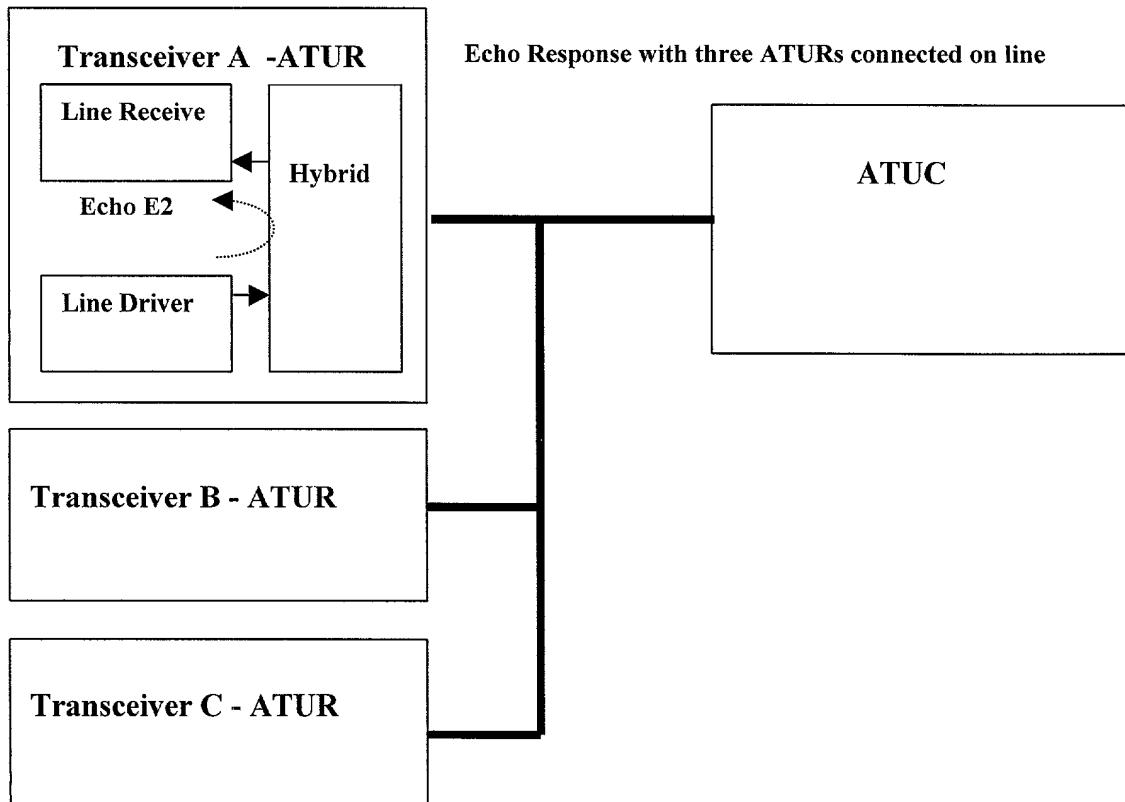


Figure 8c

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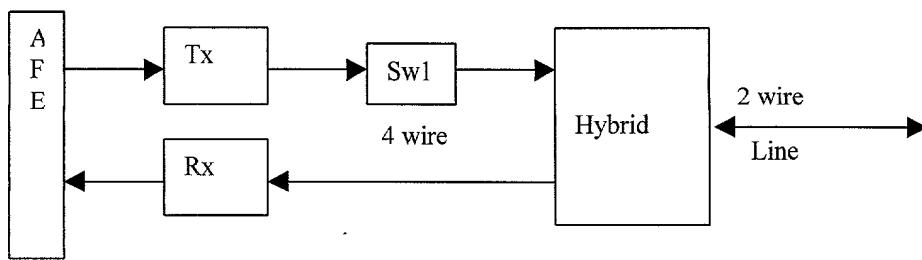


Figure 9: Implementation 1

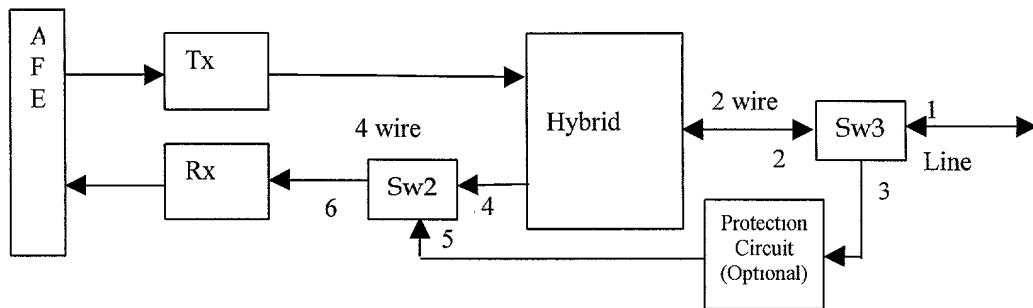


Figure 10: Implementation 2

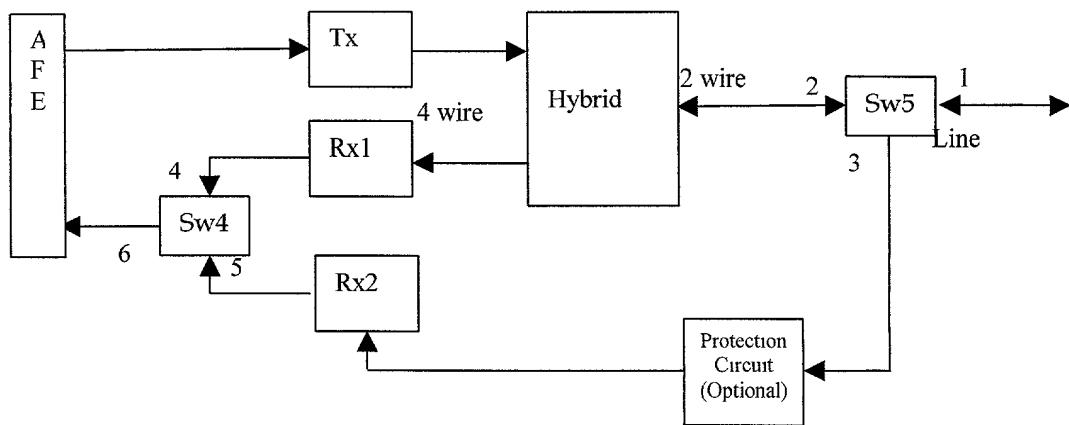


Figure 11: Implementation 3

**Legend:** Tx: Transmitter, Rx: Receiver, Sw: Switch, AFE: Analog Front End.

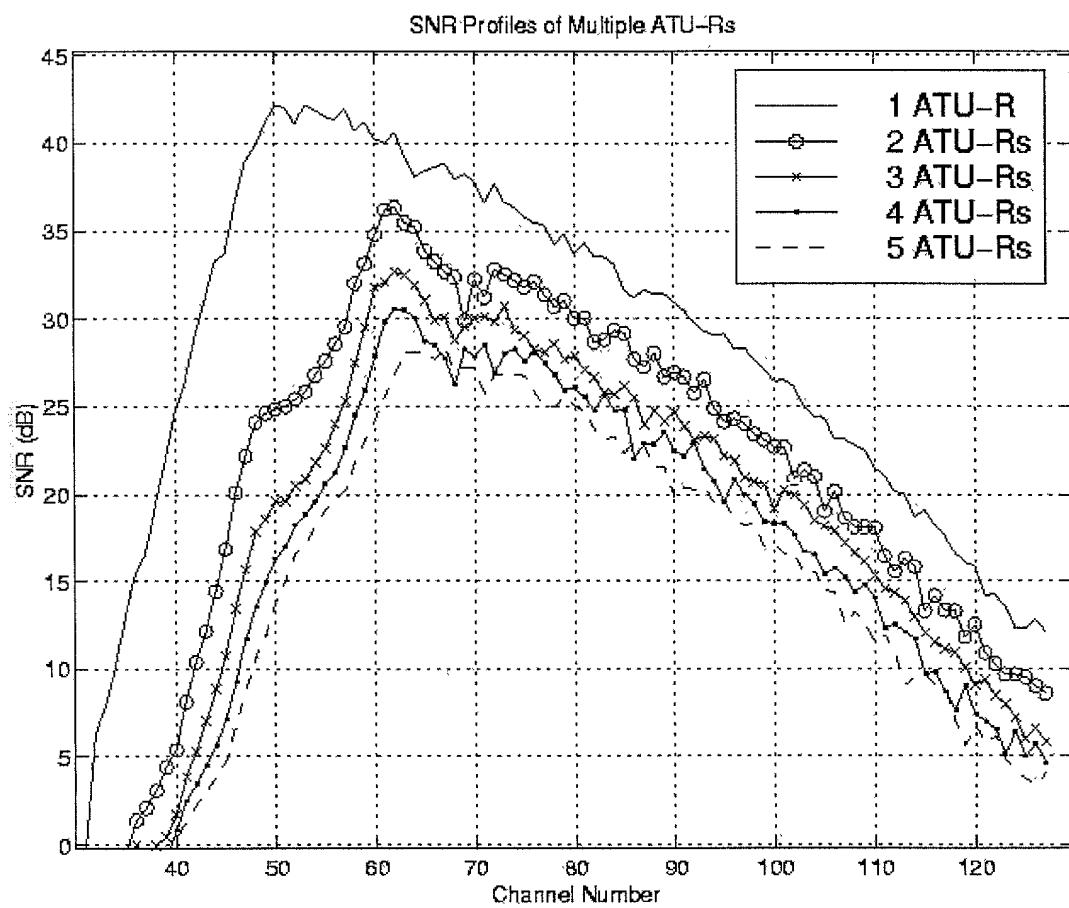


Figure 12: Simulation results of SNR profiles for multiple ATU-Rs

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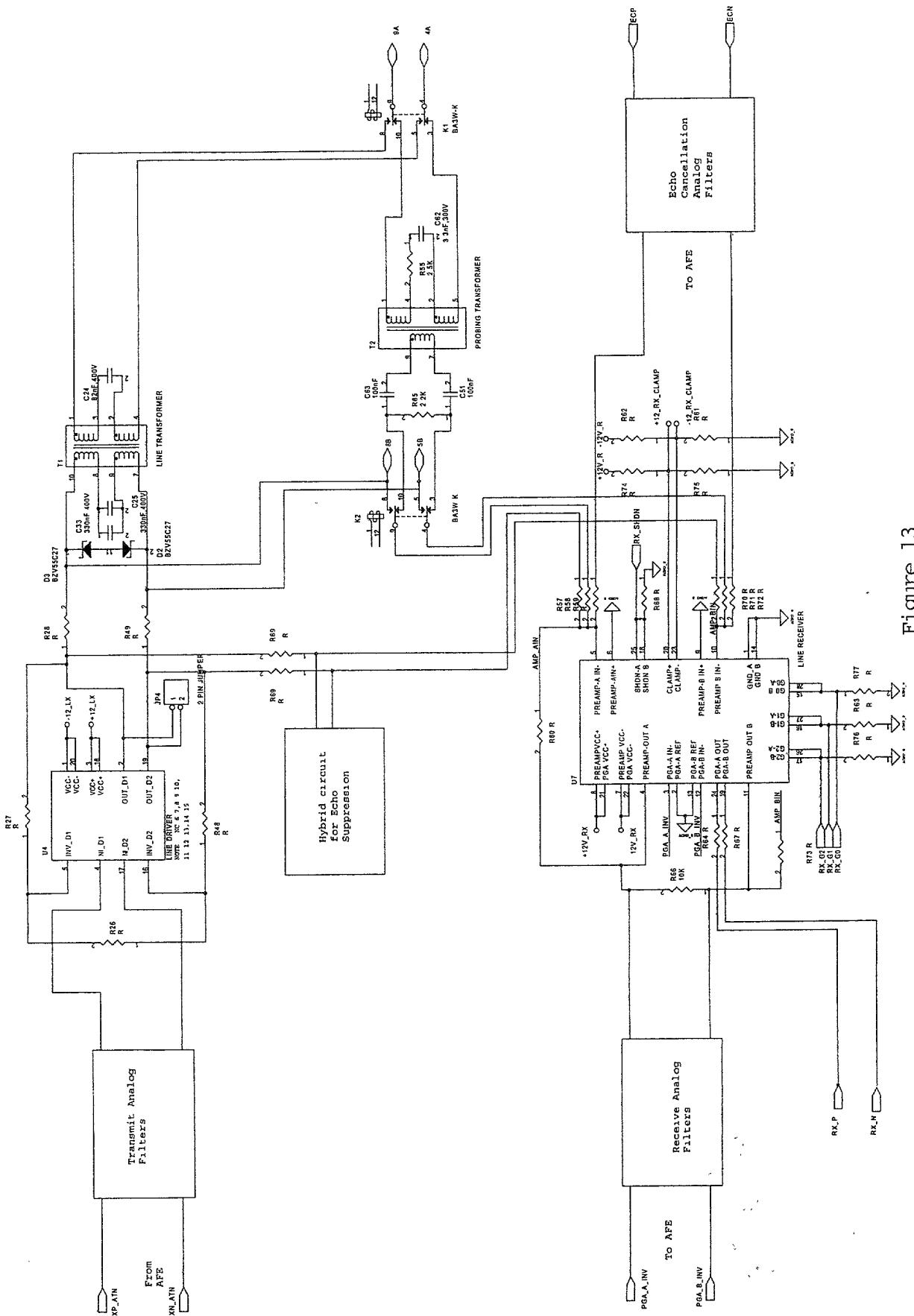


Figure 13